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Thermo-fluid-dynamics of turbulent boundary layer over a moving continuous flat sheet in a parallel free stream BUSHRA AFZAL, Corning Incorporated, NOOR AFZAL TEAM[1], BUSHRA AFZAL TEAM[2] — The momentum and thermal turbulent boundary layers over a continuous moving sheet subjected to a free stream have been analyzed in two layers (inner wall and outer wake) theory at large Reynolds number. The present work is based on open Reynolds equations of momentum and heat transfer without any closure model say, like eddy viscosity or mixing length etc. The matching of inner and outer layers has been carried out by Izakson-Millikan-Kolmogorov hypothesis. The matching for velocity and temperature profiles yields the logarithmic laws and power laws in overlap region of inner and outer layers, along with friction factor and heat transfer laws. The uniformly valid solution for velocity, Reynolds shear stress, temperature and thermal Reynolds heat flux have been proposed by introducing the outer wake functions due to momentum and thermal boundary layers. The comparison with experimental data for velocity profile, temperature profile, skin friction and heat transfer are presented. In outer non-linear layers, the lowest order momentum and thermal boundary layer equations have also been analyses by using eddy viscosity closure model, and results are compared with experimental data.

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